

VERSION OF AMENDMENTS SHOWING MARKINGS

In the Specification

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SUMMARY OF THE INVENTION

~~Refer to claims~~ In a first broad form of the invention there is provided a disc brake rotor having a central hub coaxial with and supporting annular rings which form an inboard brake disc and an outboard brake disc for engagement with brake pads, said inboard disc and said outboard disc maintained in a parallel spaced apart configuration by pillars with channels defined between said pillars whereby in use of the rotor air is drawn in through vent means and then radially outwardly through said channels as the rotor turns, said pillars arranged in repeating clusters of six with each cluster in cross section including radially aligned inner and outer pillars with pairs of intermediate pillars positioned symmetrically in a median area of said inboard and outboard brakes discs; one pair of said intermediate pillars on each side of a radially aligned central axis defined by said radially aligned inner and outer pillars; said pairs of intermediate pillars positioned to support said inboard and outboard brake discs against mechanical distortion from application of said brake pads during heavy braking; each pair of said pairs of radially aligned intermediate pillars defining a channel between the pillars comprising said pair; said channel offset from a radially aligned direction.

Preferably, sides of said central hub are inclined outwardly towards a base of said central hub and an outer periphery of said central hub leads into a heat dam.

Preferably, said vent means include inlet vents on the outboard side located in an outer face of said heat dam.

Preferably, said vent means further include inlet vents on the inboard side of said rotor.

Preferably, ports for said inlet vents on the inboard side of said rotor are located between an inner periphery of one of said rings and a contoured inlet horn formed by an inboard face of said central hub.

Preferably, said inlet vents on said inboard and said outboard sides of said rotor lead into said channels between said rings, said channels being defined by pillars.

Preferably, said pillars are arranged in clusters with each cluster being symmetrical with respect to rotational directions of said rotor.

Preferably, each cluster defines a respective pair of said channels and cooling air passes equally through one or another thereof in accordance with direction of rotor rotation.

Preferably, each cluster includes pillars, which in cross-section are of elongated triangular shape and have overlapping edges to define said pair of said

channels.

Preferably, said inner pillars of each of said clusters have an elongated diamond shape in cross-section and alternate with pillars which are triangular or bell shaped in cross—section, said inner pillars being adapted to deflect and draw cooling air from said inlet vents into said channels.

Preferably, said repeating clusters of six pillars are circumferentially disposed between said annular rings at angular intervals of 20 degrees.

Preferably, each outer pillar of said radially aligned inner and outer pillars is in a cross section form approximating that of an isosceles triangle; a base of said triangle adjacent to an outer periphery of said annular rings.

Preferably, each inner pillar of said radially aligned inner and outer pillars is in cross section of oviform or diamond shape; a long axis of said oviform shape radially aligned.

Preferably, each adjoining pair of said repeating clusters of six pillars is symmetrical about a line defined by an intermediate radially aligned inner pillar and outer pillar.

Preferably, said outer pillar is of a cross section form approximating that of

a tear drop; a base of said tear drop coincident with an outer periphery of said annular rings.

Preferably, each inner pillar of said radially aligned intermediate pillars is in cross section of a form approximating that of a bell; the base or mouth of said bell adjacent to the said inner periphery of said annular rings.

Preferably, each said cluster of six pillars includes two symmetrically opposed pairs of intermediate pillars; each pair of said opposed pairs of intermediate pillars defining an air flow channel adapted to dissipate heat from surrounding regions of said discs.

Preferably, said repeating clusters of six pillars are circumferentially disposed between said annular rings at angular intervals of 10 degrees; adjoining pairs of clusters overlapping so as to share a pair of said radially aligned intermediate pillars.

Preferably, each outer pillar of said radially aligned inner pillar and outer pillar is in cross section form approximating that of an isosceles triangle with rounded base; said base adjacent to an outer periphery of said annular rings.

Preferably, alternate ones of inner pillars of said radially aligned inner pillar and outer pillar are in cross section of oviform or diamond shape and bell shape.

Preferably, patterns of air flow are induced by rotation of said rotor; said air

flow directed from an inner periphery of said rings through channels between selected pillars of said repeating clusters of pillars to exit from said rotor at said outer periphery of said rings.

Preferably, said patterns of air flow are predetermined by direction of rotation of said rotor; a clockwise rotation determining a first pattern of said air flow and an anticlockwise rotation determining a second pattern; said second pattern being mirror reversed from said first pattern.

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shown in figure 3. The outer periphery of the hat leads into a deep heat dam 5. This construction closely aligns the web 6 with the centre-line 2A of the rotor rings 2 to reduce vibration, better defines a heat distortion point for the rotor and also facilitates a smooth flow of air into the outboard vent ports 7. These ports 7 receive a flow of cooling air unobstructed by the front wheel assembly and splash plate. They are preferably rectangular in shape and are set into the outer face 5A of the heat dam in order to pick up the air flow along inclined sides of the hat (see arrow A in figure 3). The vent outboard wall 7A preferably has a large radius surface (e.g about 20 mm) to minimise flow friction by smoothly merging into the ventilation channels between the pillars. Also shown in figures 2 and 3 are vent ports 8 leading into the ventilation channels from the inboard side of the rotor. These ports 8 are distributed around the inner periphery of the rings 2. The port walls are defined by a contoured inlet horn BA 8A formed by the inboard face of the

tapered hat sides 4. The opposite port walls ~~3D~~ 8B are formed by the inner periphery of the rings 2. They are also contoured to lead smoothly into the ventilation channels. To assist the radial inflow of air into the ports 8 the wall ~~3D~~ 8B preferably extends out further from the rotor centre line 2A than the opposite horn ~~BA~~ 8A.